

BOOK OF ABSTRACTS



**4th International Conference
on Community Ecology**

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Soil salt, nitrogen and organic matter content drive early successional plant community composition in dune systems by curbing alien invasion and enhancing native plant diversity

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Biological invasion is nowadays recognised as one of the major threats to biodiversity (Vilà et al., 2010), particularly in coastal dune ecosystems. Many studies linked the invasion of dune habitats to human disturbances, but less is known about the role of soil properties and plant traits in plant invasion.

Based on previous observational studies (Vitti et al., 2020; Lami et al. 2021), we performed a manipulative experiment in a barrier island of the Marano and Grado's lagoon, Northern Adriatic Sea. We mechanically remove all the vegetation present in the back dune system (i.e. grey dune) of the selected plots by soil milling in order to trigger a new ecological succession and test the mechanism that facilitate or curb biological invasion during the early stages of plant colonization. We further altered soil properties in 8 experimental blocks by adding salt, nitrogen and organic substances (i.e. peat) and combining those treatments in 1 m² plots with a factorial design (i.e. 8 replicates x 8 treatments = 64 plots). We recorded the emergence of seedlings with a camera system every 15 days. At the end of experiments we measure recorded the plant community composition and measured the following traits: plant height, species cover and number of individuals. In addition the same parameters were collected in 8 reference plots (i.e. surrounding unaltered plant community).

The results have showed that all the treatments have decreased the species richness of alien plants, in particular where soil salt content was enhanced. Moreover, some treatments had positive effects on the native plant cover and decreased the overall number of alien individuals, potentially reducing the initial propagule pressure due to the soil seed bank and, hence, changing the further plant community trajectories. This study provides new information on conservation and management efforts in this ecologically sensitive area, giving new insight into the dynamics of biological invasion and the impacts on native ecosystems.

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